

Section 2.0 MODEL HISTORY

Staff is continually improving the on-road vehicle emission inventory, which has become more complex and data driven as computer technology has advanced. The series of improvements in EMFAC, BURDEN and WEIGHT culminated in a relatively modern version called EMFAC7D. The major improvements in the MVEI Models, commencing with EMFAC7D, are listed below:

EMFAC7D (January 1988)

- Improved Basic Emission Rates
- Improved Deterioration Rates
- Improved mileage accumulation rates
- Improved travel fraction (VMT by age)
- Improved methodology documentation
- Improved source code/users guide documentation

EMFAC7E (July 1990)

- Addition of evaporative running losses
- Adjusted HDT emission rates to account for federal HDTs operating in California
- Modeled Urban Buses separate from HDTs
- Used CALIMFAC for I/M benefits
- Increased speed domain from 5-55 MPH to 3-65 MPH
- Disaggregated Diurnals into Partial and Multiple Day estimates
- Added evaporative resting loss emissions
- Addition of evaporative emission temperature correction factors
- Added Planning Inventory capability for non-attainment areas

EMFAC7EP (December 1990)

- Expanded Planning Inventories to attainment areas
- Added Phase I Gasoline benefits
- Added LEV emission rates
- Redefined MDT and adjusted emission rates
- Adjusted evaporative emission rates for a new certification standard/test procedure
- Updated SCFs

EMFAC7F (September 1993)

- Modeled evaporative emissions by period of the day
- Updated BERs, TCFs and SCFs
- Improved cumulative mileage curves and travel activity
- Added Phase II Gasoline and Oxygenates benefits

MVEI7G1.0 (October 1996)

- Added Cycle Correction Factors
- Added High Emitter Correction Factors

- Added CO₂ to the model
- Improved Starts Methodology
- Improved Starts Activity
- Added BERs for Enhanced I/M and Basic 96 I/M
- Added Clean Diesel Fuel benefits
- Improved VMT by speed distributions
- GUI Interface

MVEI7G1.0c (July 1997)

- Corrected program to set PM and fuel flag.
- Corrected program for model year runs.
- Changed logic in front end for option to run EMFAC only and standard report.
- Corrected BRCOUNTY file which had error in LA SEDAB.
- Revised activity data for SFAB per District's submittal.
- Revised activity data for SD per SANDAG submittal.
- Revised activity data for Fresno (SJV) per COG's submittal.
- Revised activity data for Kern (SJV) per COG's submittal.
- Corrected pre-66 model year base rates.
- Corrected BRCOUNTY to correct I/M phase-in for some counties that have start dates of
 - 1991 or 1992.
- Corrected light - duty trucks (LDT) evaporative emission rates.
- Adjusted evaporative emission rates for zero emission vehicles (T2).
- Modified cycle correction factors.
- Modified high emitter correction factors.
- Adjusted I/M implementation dates.
- Corrected minor errors in the BURDEN output.
- Corrected temperature correction factors for winter rates (50 deg F).

MVEI7G1.0c (October, 1998)

- EMFAC report table 8 -- Evaporative Running Losses -- Revised to include light heavy gas
- (LHG) and medium heavy gas (MHG) (dated June 10, 1998)
- Revised activity data for classes 7 and 8 (HDG and HDD) for years 1981-89 (July 23, 1998)
- Smooth out the 1980-1990 heavy duty truck activity to better reflect the diesel fuel sales.

MVEI7G1.0c (February 2000)

- New data for SJVAB (Fresno, Kings, Stanislaus and Tulare) (December 1998)
- SACOG (MCAB-El Dorado, MCAB-Placer, SVAB-Placer, SVAB-Sacramento, SVAB-Yolo)
- 1994-2015 data for SCCAB-Santa Barbara
- Same data as 7G (July, 1998) for SDAB, SFAB, SCAB, SJVAB (Kern, Madera, Merced, San Joaquin)

- For the Rest of Counties:
 $\text{VMT} = \text{MVSTAFF}$,
 $\text{STARTS} = \text{VEH} * \text{START RATE}$
- HDT VMT (1980-2020) based on Caltrans Truck Kilometers of Travel Reports and MVSTAFF
- Corrections to the "Fuel Consumption"
- Corrected "no I/M" option when running the model.